OUR VISION:
Department of Civil Engineering, Anna University, shall strive hard to develop and impart technical knowledge and professional skills required for Civil Engineering and Geonformatics Engineering practice through excellence in teaching, research and consultancy to address sustainable infrastructure development needs at local, national and International levels.

OUR MISSION:
Department of Civil Engineering, Anna University shall contribute to technological and development by
1. Providing a firm scientific and technological base in Civil Engineering and Geonformatics Engineering to achieve self-reliance.
2. Providing quality education through innovation in teaching practices at par with global standards.
3. Nurturing leadership and entrepreneurship qualities with ethical values.
4. Developing and disseminating latest knowledge and technologies in emerging areas of Civil Engineering and Geonformatics Engineering
5. Sharing intellectual resources and infrastructure facilities through collaborative partnership.
6. Ensuring supporting conditions for enhancing the employability skills.
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The Programme B.E. Geoinformatics will help to

PEO1 prepare the students for successful careers in Geospatial and Information Technology industries that meet the global needs.

PEO2 develop the professional ability of the students in data collection, analysis and synthesis for solving real world problems.

PEO3 inculcate entrepreneurship skills, leadership qualities and to work in teams on trans disciplinary projects.

PEO4 develop required skills in the mathematical, scientific and engineering fundamentals necessary to provide robust solutions using modern instrumentation and software tools.

PEO5 provide opportunity to imbibe requisite qualities to practice the geospatial technology with professional ethics.

PROGRAMME OUTCOMES (POs)

Graduates of B.E. Geoinformatics students will be able to

PO1 Knowledge of Engineering Sciences Apply the Knowledge of mathematics, science and Engineering fundamentals in the field of Geoinformatics Engineering.

PO2 Problem Analysis Identify, formulate and provide solution for multi-disciplinary Problems using Geoinformatics.

PO3 Design / development of Solutions design and evaluate solutions for efficient management of natural, socio-economic resources through intervention of Geoinformatics tools.

PO4 Investigations Conduct investigations of geoinformatics engineering problems including literature survey, appropriate methodology, analysis, interpretation of data and synthesis of information to provide valid conclusion.

PO5 Use of Modern Technology Design, use and apply modern technology, tools and software to address and solve the problems with due understanding of the limitations.

PO6 Engineer and Society Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to Geo Informatics Engineering Practice.

PO7 Environment and Sustainability Understand the Socio economic impact of Geo Informatics Engineering solutions for sustainable development.

PO8 Ethics Understand the commitment to professional ethics and responsibilities of Geo Informatics Engineers and to contribute to the comprehensive societal development.
Function effectively as an individual and as member or leader in diverse teams and in multi-disciplinary settings and demonstrating a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis.

Communicate effectively with the engineering community and also with society at large, and write reports and make effective presentations.

Demonstrate Knowledge of management and business practices, such as risk and change management and understand their limitations

Develop ability to engage in independent and life-long learning to improve competence by critical examination of the outcomes of one’s actions in addressing Geoinformatics Engineering issues and learning from corrective and preventive measures.

Demonstrate in-depth knowledge of Geoinformatics engineering discipline with an ability to evaluate, analyse and synthesise existing and new knowledge.

Critically analyze complex Geoinformatics problems and apply independent judgment for synthesizing information and make innovative advances in a theoretical, practical policy context.

Conceptualize and solve Geoinformatics engineering problems, evaluate potential solutions and arrive at technically feasible, economically viable and environmentally sound solutions with due consideration of health, safety and socio cultural factors.

Demonstrate Knowledge of management and business practices, such as risk and change management and understand their limitations.

Develop ability to engage in independent and life-long learning to improve competence by critical examination of the outcomes of one’s actions in addressing Geoinformatics Engineering issues and learning from corrective and preventive measures.

Programme Specific Outcomes (PSOs)

Graduates of B.E. Geoinformatics students will be able to

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<th>Knowledge of Geoinformatics discipline</th>
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<td>Critical analysis of Geoinformatics Engineering problems and innovations</td>
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Peo / Po & PSO Mapping:

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1’ = Low; ‘2’ = Medium; ‘3’ = High
## ANNA UNIVERSITY, CHENNAI
### UNIVERSITY DEPARTMENTS
### B.E. GEONFORMATICS
### REGULATIONS – 2023
### CHOICE BASED CREDIT SYSTEM
### CURRICULUM AND SYLLABI FOR SEMESTERS I AND II

### SEMESTER I

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* Skill Based Course

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* Skill Based Course

* NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.
UNIT I  
BASICS OF COMMUNICATION  
9
Listening – Telephone conversation & Writing message, gap filling; Reading – Telephone message, bio-note; Writing – Personal profile; Grammar – Simple present tense, Present continuous tense, Asking questions (wh-questions); Vocabulary – One word substitution, Synonyms

UNIT II  
NARRATION  
9
Listening – Travel podcast / Watching a travel documentary; Reading – An excerpt from a travelogue, Newspaper Report; Writing – Narrative (Event, personal experience etc.); Grammar – Subject – verb agreement, Simple past, Past continuous Tenses; Vocabulary – Antonyms, Word formation (Prefix and Suffix).

UNIT III  
DESCRIPTION  
9
Listening – Conversation, Radio/TV advertisement; Reading – A tourist brochure and planning an itinerary, descriptive article / excerpt from literature; Writing – Definitions, Descriptive writing, Checklists; Grammar – Future tense, Perfect tenses, Preposition; Vocabulary – Adjectives and Adverbs

UNIT IV  
CLASSIFICATION  
9
Listening – Announcements and filling a table; Reading – An article, social media posts and classifying (channel conversion – text to table); Writing – Note making, Note taking and Summarising, a classification paragraph; Grammar – Connectives, Transition words; Vocabulary – Contextual vocabulary, Words used both as noun and verb, Classification related words.

UNIT V  
EXPRESSION OF VIEWS  
9
Listening – Debate / Discussion; Reading – Formal letters, Letters to Editor, Opinion articles / Blogs; Writing – Letter writing/ Email writing (Enquiry / Permission, Letter to Editor); Grammar – Question tags, Indirect questions, Yes / No questions; Vocabulary – Compound words, Phrasal verbs.

Assessment
Two Written Assessments: 35% weightage each
Assignment: 30% weightage
Designing a tourist brochure / Writing an opinion article / Making a travel podcast

End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Use grammar and vocabulary suitable for general context.
CO2: Comprehend the nuances of spoken and written communication.
CO3: Use descriptive and analytical words, phrases, and sentence structures in written communication.
CO4: Read different types of texts and comprehend their denotative and connotative meanings.
CO5: Write different types of texts using appropriate formats.

TEXT BOOKS:
1. “English for Engineers and Technologists” Volume I by Orient Blackswan, 2022
REFERENCES
4. www.uefap.com

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high

MA3151 MATRICES AND CALCULUS

UNIT I MATRICES
Eigen values and Eigen vectors of a real matrix – Properties of Eigen values - Cayley-Hamilton theorem (excluding proof) – Diagonalization of matrices - Reduction of Quadratic form to canonical form by using orthogonal transformation - Nature of a Quadratic form.

UNIT II FUNCTIONS OF SEVERAL VARIABLES

UNIT III INTEGRAL CALCULUS
Improper integrals of the first and second kind and their convergence – Differentiation under integrals - Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions-Properties – Evaluation of integrals by using Beta and Gamma functions – Error functions.

UNIT IV MULTIPLE INTEGRALS

UNIT V VECTOR CALCULUS
Gradient of a scalar field, directional derivative – Divergence and Curl – Solenoidal and Irrotational vector fields - Line integrals over a plane curve - Surface integrals – Area of a curved surface – Volume Integral - Green’s theorem, Stoke’s and Gauss divergence theorems – Verification and applications in evaluating line, surface and volume integrals.

TOTAL: 60 PERIODS

COURSE OUTCOMES:
At the end of the course, the students will be able to:
CO1: Use the matrix algebra methods for solving practical problems.
CO2: Use differential calculus ideas on several variable functions.
CO3: Apply different methods of integration in solving practical problems by using Beta and Gamma functions.

CO4: Apply multiple integral ideas in solving areas and volumes problems.

CO5: Apply the concept of vectors in solving practical problems.

TEXT BOOKS:

REFERENCES:

CO-PO Mapping

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1-low, 2-medium, 3-high

PH3151  ENGINEERING PHYSICS  L T P C
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UNIT I  MECHANICS OF MATERIALS  9

UNIT II  OSCILLATIONS, SOUND AND THERMAL PHYSICS  9
UNIT III  
**OPTICS AND LASERS**

UNIT IV  
**QUANTUM MECHANICS**

UNIT V  
**CRYSTAL PHYSICS**

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After completion of this course, the students shall be
CO1: Understand the important mechanical properties of materials
CO2: Express the knowledge of oscillations, sound and applications of Thermal Physics
CO3: Know the basics of optics and lasers and its applications
CO4: Understand the basics and importance of quantum physics.
CO5: Understand the significance of crystal physics.

TEXT BOOKS:

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1-low, 2-medium, 3-high
UNIT I
POLYMER CHEMISTRY


Engineering Plastics: Polyamides, Polycarbonates and Polyurethanes. Compounding and Fabrication Techniques: Injection, Extrusion, Blow and Calendaring

UNIT II
NANOCHEMISTRY


UNIT III
CORROSION SCIENCE


UNIT IV
ENERGY SOURCES

Batteries - Characteristics - types of batteries – primary battery (dry cell), secondary battery (lead acid, lithium-ion-battery) - emerging batteries – nickel-metal hydride battery, aluminum air battery, batteries for automobiles and satellites - Fuel cells (Types) – H2-O2 fuel cell - Supercapacitors-Types and Applications, Renewable Energy: Solar- solar cells, DSSC

UNIT V
WATER TECHNOLOGY


TOTAL: 45 PERIODS

COURSE OUTCOMES:

CO1: To recognize and apply basic knowledge on different types of polymeric materials, their general preparation methods and applications to futuristic material fabrication needs.

CO2: To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.

CO3: To recognize and apply basic knowledge on suitable corrosion protection technique for practical problems.

CO4: To recognize different storage devices and apply them for suitable applications in energy sectors.

CO5: To demonstrate the knowledge of water and their quality in using at different industries.
10

TEXT BOOKS:

REFERENCES:

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1-low, 2-medium, 3-high

GE3155 ENGINEERING DRAWING

L T P C
2 0 4 4

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES
Basic Geometrical constructions. Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACE
Orthographic projection- Principal planes - First angle projection - projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths a and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS AND FREEHAND SKETCHING
Projection of simple solids like prisms, pyramids, cylinder, and cone when the axis is inclined to both the principal planes by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles —Representation of Three-Dimensional objects — Layout of views-Freehand sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of simple objects by CAD Software (Not for examination).

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES
Sectioning of simple solids like prisms, pyramids, cylinder, and cone in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes. Practicing three dimensional modeling of simple truncated objects by CAD Software (Not for examination).
UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS  
Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids, cone and cylinders by visual ray method. Creating isometric model of simple objects from orthographic projections using CAD software (Not for examination).

TOTAL : 90 PERIODS

COURSE OUTCOMES:
On successful completion of this course, the student will be able to
CO1. Draw conic curves, cycloids and involutes
CO2. Draw orthographic projections of points, lines and planes
CO3. Draw orthographic projections and free hand sketches of solids
CO4. Draw sectional views of the objects and development of surfaces.
CO5. Draw isometric and perspective views of simple solids

TEXTBOOKS:

REFERENCES:

Publication of Bureau of Indian Standards:

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high
அகத்தி புத்தக சித்தாக்குகள்:

1. பார்வையுடைய பார்வைகள் - நூல்களின் சிலங்கள் - குருக்கு - குருவிய், என போன்றவைகள்
2. புத்தகங்கள் பொருளே புத்தகங்கள்
3. பருமருகியல் புத்தகங்கள் - தமிழ் புத்தகங்கள்

அகத்தி தமிழ்தமிழ் பொருள் சித்தாக்குகள்

1. தமிழ் பொருள் சித்தாக்குகள்
2. தமிழ் பொருள் சித்தாக்குகள்
3. தமிழ் பொருள் சித்தாக்குகள்

நான்காம் வருடம்

3. தமிழ் பொருள் சித்தாக்குகள்

நிலைப்பாடுகள்

3. தமிழ் பொருள் சித்தாக்குகள்

TEXT-CUM-REFERENCE BOOKS

1. நூல்கள் பயணிகள் - பார்வையுடைய குருக்கு - என்னுடைய
2. குருவிய்கள் - பொருள்கள் - என்னுடைய
3. பொருள் சித்தாக்குகள் - தமிழ் பொருள் சித்தாக்குகள்
4. பொருள் சித்தாக்குகள் - தமிழ் பொருள் சித்தாக்குகள்
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

GE3154

HERITAGE OF TAMILS

UNIT I

LANGUAGE AND LITERATURE


UNIT II

HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE


UNIT III

FOLK AND MARTIAL ARTS

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV

THINAI CONCEPT OF TAMILS

Flora and Fauna of Tamil & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT V

CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

2. கைவுண்டு பண்படுத்து – பண்படுத்து மக்களே. (சிங்கவிப் பிள்ற்றோ).
3. தமிழ் வைகாதம் கருத்தியல் தமிழ் வைகாதம் (தமிழ் வைகாதம் தமிழ் வைகாதம்).
4. வாழ்வு – ஆற்றங்கமர் நொகரிகம் (செயல்பாடுகள் கூறும் விபரம்)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
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GE3161 ENGINEERING PRACTICES LABORATORY L T P C
0 0 4 2

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICES

PLUMBING:
Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.
   a) Laying pipe connection to the suction side of a pump
   b) Laying pipe connection to the delivery side of a pump.
   c) Practice in connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:
Sawing, planing and making joints like T-Joint, Mortise and Tenon joint and Dovetail joint.

STUDY EXCERSISES
   a) Study of joints in door panels and wooden furniture
   b) Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICES

   a) Basic household wiring using Switches, Fuse, Indicator and Lamp etc.,
   b) Stair case light wiring
   c) Tube – light wiring
   d) Preparation of wiring diagrams for a given situation.
   e) Study of Iron-Box, Fan Regulator and Emergency Lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICES

WELDING
   a) Arc welding of Butt Joints, Lap Joints, and Tee Joints
   b) Gas welding demonstration.
c) Basic Machining - Simple turning, drilling and tapping operations.
d) Study and assembling of the following: Centrifugal pump, Mixer, Air-conditioner

**SHEET METAL PRACTICE:** Making of a square tray

**DEMONSTRATION ON FOUNDRY OPERATIONS.**

**4. ELECTRONIC ENGINEERING PRACTICES**

a) Soldering simple electronic circuits and checking continuity.
b) Assembling electronic components on a small PCB and Testing.
c) Study of Telephone, FM radio and Low Voltage Power supplies.

TOTAL: 60 PERIODS

**COURSE OUTCOMES:**

CO1. Ability to make common joints in carpentry and pipe connections with fittings used in plumbing works.

CO2. Ability to do electrical wiring for household applications.

CO3. Ability to weld the steel the structures and soldering of electronic connections and testing of PCBs

**CO-PO & PSO MAPPING**

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1-low, 2-medium, 3-high

**CY3161 CHEMISTRY LABORATORY**

**(Minimum of 8 experiments to be conducted)**

**LIST OF EXPERIMENTS:**

1. Estimation of HCl using Na₂CO₃ as primary standard
2. Determination of alkalinity in water sample.
3. Determination of hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler’s method.
5. Determination of chloride content of water sample by Argentometric method.
6. Estimation of copper content of the given solution by Iodometry.
7. Determination of strength of given hydrochloric acid using pH meter.
8. Determination of strength of acids in a mixture of acids using conductivity meter.
9. Estimation of iron content of the given solution using potentiometer.
10. Estimation of iron content of the water sample using spectrophotometer (1, 10-Phenanthroline/thiocyanate method).
11. Estimation of sodium and potassium present in water using flame photometer.
13. Determination of Glass transition temperature of a polymer
14. Phase change in a solid.
15. Corrosion experiment-weight loss method.

TOTAL: 30 PERIODS
COURSE OUTCOMES:
After completion of the laboratory course, the student will be able to –
CO1: analyse the water quality parameters for domestic and industrial purposes.
CO2: determine the amount of metal ions by spectroscopic techniques
CO3: select a suitable polymer for industrial applications.
CO4: quantitatively analyse the impurities in solution by electroanalytical techniques.
CO5: predict the choice of metals for industrial purposes using corrosion studies.

TEXTBOOKS:

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GE3162 ENGLISH LABORATORY – I

UNIT I SELF-INTRODUCTION
Introducing oneself; Telephone conversation, Relaying telephone message – Role play

UNIT II NARRATION
Narrating one’s personal experience in front of a group (formal and informal context)
Ex.: First day in college / vacation / first achievement etc.

UNIT III CONVERSATION
Making conversation – formal and informal – Turn taking and Turn giving – Small talk

UNIT IV SHORT SPEECH
Giving short speeches on topics like College Clubs and their activities in the college / Campus Facilities / native place and its major attractions.

UNIT V DISCUSSION
Taking part in a group discussion on general topics – Debating on topics of interest and relevance.

Assessment
Internals – 100%
Short Speeches
Group discussion

TOTAL : 30 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1. Communicate effectively in formal and informal contexts
CO2. Converse appropriately and confidently with different people
CO3. Express their opinions assertively in group discussions

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CO-PO & PSO MAPPING

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HS3251  ENGLISH FOR COMMUNICATION – II  

UNIT I  CAUSE AND EFFECT  9
Listening – Radio / TV / Podcast Interview (survivors tale) and framing a set of instructions/ Do’s and Don’ts; Reading – Excerpts of Literature (short stories), Journal articles on issues like Global warming; Writing - Instructions; Official letter / email (Request for internship / Industrial visit); Grammar – If conditionals, Imperatives; Vocabulary – Cause and effect expressions, Idiom

UNIT II  COMPARE AND CONTRAST  9
Listening – Product reviews and gap fill exercises, Short Talks (like TED Talks) for specific information; Reading – Graphical content (table / chart / graph) and making inferences; Writing – Compare and Contrast Essay; Grammar – Degrees of Comparison; Mixed Tenses; Vocabulary – Order of Adjectives, Transition words.

UNIT III  PROBLEM AND SOLUTION  9
Listening – Group discussion (case study); Reading – Visual content (Pictures on social issues / natural disasters) for comprehension; Editorial; Writing Picture description; Problem and Solution Essay; Grammar – Modal verbs; Relative pronoun; Vocabulary – Negative prefixes, Signal words for problem and solution.

UNIT IV  REPORTING  9
Listening – Oral news report; Reading – Newspaper report on survey findings – Writing – Survey report, Making recommendations; Grammar – Active and passive voice, Direct and Indirect speech; Vocabulary – Reporting verbs, Numerical adjectives.

UNIT V  PRESENTATION  9
Listening – Job interview, Telephone interview; Reading - Job advertisement and company profile and making inferences; Writing – Job application (cover letter and CV) Grammar – Prepositional phrases; Vocabulary – Fixed expressions, Collocations.

Assessment
Two Written Assessments: 35% weightage each
Assignment: 30% weightage
Conducting a survey on specific topic and write a final survey report.
End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

17
COURSE OUTCOMES
On completion of the course, the students will be able to:
CO1. Listen effectively to various oral forms of conversation, lectures, discussion and understand the main gist of the content.
CO2. Communicate effectively in formal and informal context.
CO3. Read and comprehend technical texts effortlessly.
CO4. Write reports and job application for internship or placement.
CO5. Learn to use language effectively in a professional context.

TEXT BOOKS
1. “English for Engineers and Technologists” Volume 2 by Orient Blackswan, 2022

REFERENCES
4. www.uefap.com

CO-PO & PSO MAPPING

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MA3251 ORDINARY DIFFERENTIAL EQUATIONS AND TRANSFORM TECHNIQUES  L T P C
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UNIT I  ORDINARY DIFFERENTIAL EQUATIONS  (9+3)

UNIT II  LAPLACE TRANSFORMS  (9+3)

UNIT III  FOURIER SERIES  (9+3)
Dirichlet’s conditions – General Fourier series – Odd and even functions – Half-range Sine and Cosine series – Complex form of Fourier series – Parseval’s identity – Harmonic Analysis.
UNIT IV FOURIER TRANSFORMS (9+3)
Fourier integral theorem – Fourier transform pair - Fourier sine and cosine transforms – Properties – Transform of elementary functions - Convolution theorem (without proof) – Parseval’s identity.

UNIT V Z – TRANSFORM AND DIFFERENCE EQUATIONS (9+3)

TOTAL: 60 PERIODS

COURSE OUTCOMES:
At the end of the course, the students will be able to:
CO1: Solve higher order ordinary differential equations which arise in engineering applications.
CO2: Apply Laplace transform techniques in solving linear differential equations.
CO3: Apply Fourier series techniques in engineering applications.
CO4: Understand the Fourier transforms techniques in solving engineering problems.
CO5: Understand the Z-transforms techniques in solving difference equations.

TEXT BOOKS:

REFERENCES:

CO-PO Mapping

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1-low, 2-medium, 3-high

PH3201 PHYSICS FOR GEO- INFORMATICS ENGINEERING

UNIT I INTRODUCTION TO SPACE WEATHER
Sun Heliosphere: corona and the solar wind, interplanetary magnetic field coronal mass ejections, cosmic rays - Earth’s Space environment: dipole magnetic field, the structure of the inner magnetosphere, interaction of solar wind and magnetosphere, magnetic reconnection, magnetotail, plasma sheet convection - Earth’s upper atmosphere: thermosphere, ionosphere, structure and variation, aurora-Radiation impacts on satellites – Radio communication and navigation impacts
UNIT II  HEAT TRANSFER  9
Modes of heat transfer - Conduction, Convection and Radiation – Importance of material properties in heat transfer — Thermal conductivity - Specific heat capacity - Steady state conduction through constant area - Principle of convection- Free & forced convective heat transfer- Radiation heat transfer-black and grey body radiation.

UNIT III  OPTICS FOR REMOTE SENSING  9

UNIT IV  GRAVITATION  9
Newton’s law of gravitation - Gravitational field and potential - Determination of gravity - Variation of acceleration due to gravity of the earth with depth, altitude and rotation of the earth — Refraction - Diffraction - Fresnel theory, Circular diffraction gravity, Polarization double distraction – Escape velocity - Kepler’s law of planetary motion - Doppler effect.

UNIT V  ELECTRO-OPTIC SENSORS  9
Photomultipliers, photoresistors, photodiodes, nonselective detectors - Optical receivers, PIN and APD, optical preamplifiers - Detectors: basic detector mechanisms, noise in detectors. thermal and photoemissive detectors, photoconductive and photovoltaic detectors, performance limits, photographic sensitivity, time and frequency response-hybrid photodetectors - Imaging detectors - eye and vision - photographic film - Camera tubes - Solid state arrays - video detector electronics, detector interfacing.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
• On completion of the course, the student is expected to be able to
CO1 Acquire knowledge in specialty physics by further exploring space weather and the effect of those environments on satellites.
CO2 Implement the heat transfer principles in remote sensing.
CO3 understand the basic optical principles
CO4 Understand the fundamentals of gravitation.
CO5 Gain knowledge about different types of electro-optic sensors and its detection mechanism

TEXTBOOKS:

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CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high

GE3153 PROGRAMMING IN C

UNIT I - BASICS OF C PROGRAMMING 6+12
Introduction to programming paradigms — Structure of C program - C programming: Data Types - Constants - Keywords - Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements - Decision making statements - Switch statement.

PRACTICALS:
- Designing programs with algorithms/flowchart
- Programs for i/o operations with different data types
- Programs using various operators
- Programs using decision making and branching statements

UNIT II – LOOP CONTROL STATEMENTS AND ARRAYS 6+12
Iteration statements: For, while, Do-while statements, nested loops, break & continue statements - Introduction to Arrays: Declaration, Initialization - One dimensional array - Two dimensional arrays – Searching and sorting in Arrays – Strings – string handling functions - array of strings

PRACTICALS:
- Programs using for, while, do-while loops and nested loops.
- Programs using arrays and operations on arrays.
- Programs implementing searching and sorting using arrays
- Programs implementing string operations on arrays

UNIT III - FUNCTIONS AND POINTERS 6+12
Modular programming - Function prototype, function definition, function call, Built-in functions – Recursion – Recursive functions - Pointers - Pointer increment, Pointer arithmetic - Parameter passing: Pass by value, Pass by reference, pointer and arrays, dynamic memory allocation with malloc/calloc

PRACTICALS:
- Programs using functions
- Programs using recursion
- Programs using pointers & strings with pointers
- Programs using Dynamic Memory Allocation

UNIT IV - STRUCTURES AND UNION 6+12
Storage class, Structure and union, Features of structures, Declaration and initialization of structures, array of structures, Pointer to structure, structure and functions, typedef , bit fields , enumerated data types, Union.
PRACTICALS:
- Programs using Structures
- Programs using Unions
- Programs using pointers to structures and self-referential structures

UNIT V – MACROS AND FILE PROCESSING


PRACTICALS:
- Programs using pre-processor directives & macros
- Programs to handle file operations
- Programs to handle file with structure

COURSE OUTCOMES:
Upon completion of the course, the students will be able to

CO1: Write simple C programs using basic constructs.
CO2: Design searching and sorting algorithms using arrays and strings.
CO3: Implement modular applications using Functions and pointers.
CO4: Develop and execute applications using structures and Unions.
CO5: Solve real world problem using files.

TOTAL PERIODS: 90 (30+60)

TEXT BOOKS:

REFERENCES

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1 - low, 2 - medium, 3 - high
GE3151          ENGINEERING MECHANICS            L T P C
                                3 1 0  4

UNIT I            STATICS OF PARTICLES            9+3
Fundamental Concepts and Principles, Systems of Units, Method of Problem Solutions, Statics of
Particles - Forces in a Plane, Resultant of Forces, Resolution of a Force into Components,
Rectangular Components of a Force, Unit Vectors. Equilibrium of a Particle - Newton’s First Law of
Motion, Space and Free-Body Diagrams, Forces in Space, Equilibrium of a Particle in Space.

UNIT II            EQUILIBRIUM OF RIGID BODIES AND TRUSSES            9+3
Principle of Transmissibility, Equivalent Forces, Vector Product of Two Vectors, Moment of a Force
about a Point, Varignon’s Theorem, Rectangular Components of the Moment of a Force, Scalar
Product of Two Vectors, Mixed Triple Product of Three Vectors, Moment of a Force about an Axis,
Couple - Moment of a Couple, Equivalent Couples, Addition of Couples, Resolution of a Given Force
into a Force - Couple system, Further Reduction of a System of Forces, Equilibrium in Two and Three
Dimensions - Reactions at Supports and Connections – Analysis of Trusses – Method of Joints and
Method of Sections.

UNIT III            DISTRIBUTED FORCES            9+3
Centroids of lines and areas – symmetrical and unsymmetrical shapes, Determination of Centroids
by Integration, Theorems of Pappus-Guldinus, Distributed Loads on Beams, Centre of Gravity of a
Three-Dimensional Body, Centroid of a Volume, Composite Bodies, Determination of Centroids of
Volumes by Integration,
Moments of Inertia of Areas and Mass - Determination of the Moment of Inertia of an Area by
Integration , Polar Moment of Inertia, Radius of Gyration of an Area , Parallel-Axis Theorem ,
Moments of Inertia of Composite Areas, Moments of Inertia of a Mass - Moments of Inertia of Thin
Plates , Determination of the Moment of Inertia of a Three-Dimensional Body by Integration.

UNIT IV            FRICTION AND WORK PRINCIPLES            9+3
The Laws of Dry Friction, Coefficients of Friction, Angles of Friction, Wedges, Wheel Friction. Rolling
Resistance, Ladder friction. Work of a Force, Kinetic Energy of a Particle, Principle of Work and
Energy, Principle of Impulse and Momentum, Impact, Method of Virtual Work - Work of a Force,

UNIT V            DYNAMICS OF PARTICLES AND RIGID BODIES            9+3
Kinematics - Rectilinear Motion and Curvilinear Motion of Particles. Kinetics- Newton’s Second Law
of Motion - Equations of Motions, Dynamic Equilibrium, Energy and Momentum Methods –
Kinematics of Rigid Bodies and Plane Kinetics.

TOTAL : 60 PERIODS

COURSE OUTCOMES: Upon completion of this course, the students will be able to:

CO1 To determine the resultant forces acting on a particle in 2D and 3D and to apply methods of
equilibrium on a particle in 2D and 3D.

CO2 Evaluate the reaction forces for bodies under equilibrium, to determine moment of a force,
moment of a couple, to resolve force into a force-couple system and to analyze trusses

CO3 Assess the centroids of 2D sections / center of gravity of volumes and to calculate area
moments of inertia for the sections and mass moment of inertia of solids.

CO4 Evaluate the frictional forces acting at the contact surfaces of various engineering systems
and apply the work-energy principles on a particle. evaluate the kinetic and kinematic
parameters of a particle.

CO5 Determine kinetic and kinematic parameters of the rigid bodies subjected to concurrent
coplanar forces.
TEXTBOOKS:

REFERENCES:

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NCC Credit Course Level 1*

NX3251 (ARMY WING) NCC Credit Course Level - I

NCC GENERAL

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NATIONAL INTEGRATION AND AWARENESS

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### PERSONALITY DEVELOPMENT

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### LEADERSHIP

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### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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### TOTAL : 30 PERIODS

#### NCC Credit Course Level 1* (NAVAL WING) NCC Credit Course Level - I

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### PERSONALITY DEVELOPMENT

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### TOTAL : 30 PERIODS
# NCC Credit Course Level 1*

**NX3253**  
*(AIR FORCE WING) NCC Credit Course Level - I*  
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## NCC General
- **NCC 1**: Aims, Objectives & Organization of NCC  
- **NCC 2**: Incentives  
- **NCC 3**: Duties of NCC Cadet  
- **NCC 4**: NCC Camps: Types & Conduct  

### National Integration and Awareness
- **NI 1**: National Integration: Importance & Necessity  
- **NI 2**: Factors Affecting National Integration  
- **NI 3**: Unity in Diversity & Role of NCC in Nation Building  
- **NI 4**: Threats to National Security  

## Personality Development
- **PD 1**: Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving  
- **PD 2**: Communication Skills  
- **PD 3**: Group Discussion: Stress & Emotions  

## Leadership
- **L 1**: Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code  
- **L 2**: Case Studies: Shivaji, Jhasi Ki Rani  

## Social Service and Community Development
- **SS 1**: Basics, Rural Development Programmes, NGOs, Contribution of Youth  
- **SS 4**: Protection of Children and Women Safety  
- **SS 5**: Road / Rail Travel Safety  
- **SS 6**: New Initiatives  
- **SS 7**: Cyber and Mobile Security Awareness  

**TOTAL : 30 PERIODS**

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**GE3251**  
தமிழ் தொழில் நுட்பம்  
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### அதிகங்கள் மேற்படுத்தப்படும் பகுதிகள் சிவப்பு நுட்பம்:
- காலநிலை, வாராய்வு எனவும் - பாடல் லிருந்து நுட்பம் காலனி பாடல் பாடல்களின் - பால்கள் காலனி காலனி காலனி.  

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TEXT-CUM-REFERENCE BOOKS
1. Tamil Culture - Background - Sources (Jointly Published with Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
2. Ancient Tamil Culture - Project (Compiled by S. Vinayagam)
3. Historical Heritage of the Tamils (Dr. S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies)
4. Social Life of Tamils (Dr. K.K. Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
5. Social Life of the Tamils - The Classical Period (Dr. S. Singaravelu) (Published by: International Institute of Tamil Studies)
6. The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies)
7. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
8. Studies in the History of India with Special Reference to Tamil Nadu (Dr. K.K. Pillay) (Published by: The Author)
9. Porunai Civilisation (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

TOTAL: 15 PERIODS
UNIT I  WEAVING AND CERAMIC TECHNOLOGY  
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffito on Potteries.

UNIT II  DESIGN AND CONSTRUCTION TECHNOLOGY  
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT III  MANUFACTURING TECHNOLOGY  

UNIT IV  AGRICULTURE AND IRRIGATION TECHNOLOGY  
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V  SCIENTIFIC TAMIL & TAMIL COMPUTING  

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. குருவினா மரபுயாத்து - மக்களும் பண்பொடும் – மக்களும் பண்பொடும் (தமிழ்நோடு: குருவினா மரபுயாத்து - மக்களும் பண்பொடும்)
2. குருவினா மரபுயாத்து – குருவினா மரபுயாத்து (தவளியீடு: குருவினா மரபுயாத்து)
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4. குருவினா மரபுயாத்து – குருவினா மரபுயாத்து (தவளியீடு: குருவினா மரபுயாத்து)
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11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
PH3161  PHYSICS LABORATORY

Any SEVEN Experiments

1. Torsional Pendulum - Determination of rigidity modulus of wire and moment of inertia of the disc
2. Non-uniform bending - Determination of Young’s modulus of the material of the beam.
3. Uniform bending - Determination of Young’s modulus of the material of the beam.
4. Lee’s Disc Experiment - Determination of thermal conductivity of bad conductors.
5. Viscosity of Liquids.
6. Acoustic grating - Determination of the velocity of ultrasonic waves in liquids.
7. Ultrasonic interferometer – determination of sound velocity and liquids compressibility
8. Laser - Determination of the wavelength of the laser using grating
   - Determination of the width of the groove of the compact disc using laser.
   - Estimation of laser parameters.
9. Air wedge - Determination of the thickness of a thin sheet/wire
10. a) Optical fibre - Determination of Numerical Aperture and acceptance angle
    b) - Determination of bending loss of fibre.
11. Spectrometer - Determination of the wavelength of light using grating
12. Michelson Interferometer - Determination of wavelength of the monochromatic source of light.
13. Photoelectric effect – Determination of Planck’s constant
14. Black body radiation (Demonstration)
15. Melde’s string experiment - Standing waves.
16. Forced and Damped Oscillations.
17. Thermistor sensor
18. Thermocouple sensor
20. Design LCR series and parallel circuit and estimation of the resonant frequency.
22. Four Probe Set up – determination of band gap/resistivity of a material.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able

CO1: To determine various moduli of elasticity, thermal properties of materials and viscosity of liquids

CO2: To determine the velocity of ultrasonic waves in Liquids.

CO3: To calculate and analyze various optical properties.

CO4: To build and analyze the characteristics of mechanical vibrations and logic operation.

CO5: To determine the desired electric and magnetic parameters of materials, semiconductors devices and sensors.

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high
UNIT I  INTERVIEW IN SOCIAL CONTEXT  6
Asking questions and answering - Conducting an interview (of an achiever / survivor) – Role play activity.

UNIT II  PERSUASIVE SKILLS  6
Speaking about specifications of a product (Eg. Home appliances) – Persuasive Talk – Role play activity.

UNIT III  CASE STUDY  6
Discussions on Case Study to find solutions for problems in professional contexts – Analytical discussion on various aspects of a given problem.

UNIT IV  VISUAL INTERPRETATION  6
Describing visual content (Pictures/Table/Chart) using appropriate descriptive language and making appropriate inferences and giving recommendations.

UNIT V  PRESENTATION  6
Making presentation with visual component (PPT slides) (job interview / project / innovative product presentation)

Assessment
Internals – 100%
Picture / Graphical description and Interpretation
Formal Presentation with visual tool (like PPT)

TOTAL : 30 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Comprehend and transcode visual content appropriately.
CO2: Participate effectively in formal group discussions.
CO3: Make presentation on a given topic in a formal context.

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high